Product Overview

Optimizing High-Speed, High-Voltage Control Loops with Comparators

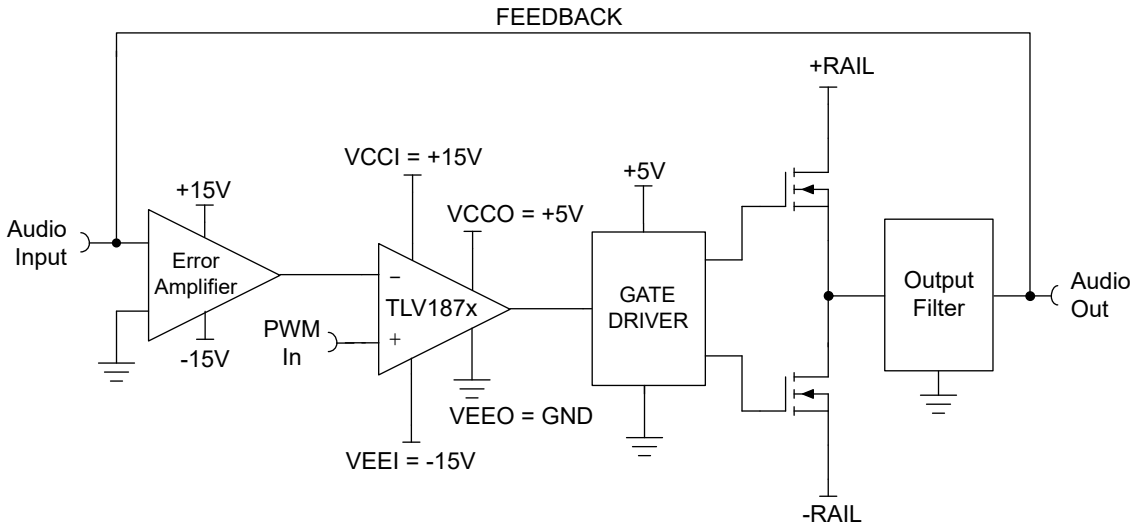

Figure 1. Class D Amplifier Example

Design Challenges:

- Input signals can be bipolar in nature (contains both positive and negative voltages) or the signals can originate from circuits operating at different supply voltage than downstream digital circuitry.
- The timing accuracy of the input signals needs to be preserved. This includes rising and falling edges of the waveforms.
- Downstream control devices require standard, single-ended logic levels at the inputs.

How High-Speed, High-Voltage Comparators with Separate Supplies Benefit the System

- The ability of a comparator to operate from independent input and output supplies eliminates the need to level shift input signals, greatly simplifying the input signal path.
  - The input supplies can be bipolar (+/-15V), while the output supply is ground referenced (single-ended) 3.3V or 5V.
  - The input supply can be single-ended 12V, 24V, or 36V, while the output supply is standard logic level.
- Fast propagation delay minimizes timing delays from input monitoring to output control.
- Push-pull output stage allows output rising and falling edges to have similar timing characteristics and shape.

Part Number	Temp Range	Input Supply Range	Output Supply Range	Propagation Delay	Input Offset Voltage
TLV1871/2	-40 to 125C	2.7 to 40V +/-1.35V to +/-20V	2.7 to 40V	tpLH 65ns tpHL 65ns	+/-500µV
LM111 LM211 LM311	-55 to 125C -40 to 85C 0 to 70C	3.5 to 30V +/-1.75V to +/-15V	3.5V to 30V	tpLH 115ns tpHL165ns	+/-700µV +/-700µV +/-2mV

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